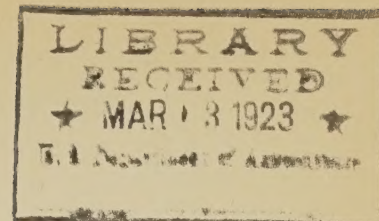


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SUMMARY

of the

U. S. Department of Agriculture

Exhibit on Dairying

No. 2.





DESCRIPTION AND SUMMARY OF THE DEPARTMENT OF AGRICULTURE  
EXHIBIT ON DAIRYING, DISPLAYED AT THE NATIONAL  
DAIRY EXPOSITION, 1922.

SUBJECT MATTER.

To further the development of the dairy industry by bringing new and helpful information to dairy farmers, manufacturers, investigators, and consumers, is the purpose of the 1922 dairy exhibit, presented by the United States Department of Agriculture. The exhibit is educational, and covers the field of dairying from the breeding and feeding of dairy animals on through to the utilization and marketing of the finished dairy products. It is intended primarily for use at dairy shows and other gatherings where large numbers of people interested in dairying may be reached.

The exhibit is made up of 29 unites or booths, each booth dealing with one phase of dairy farming, manufacturing, or marketing. The titles of the various booths are as follows:

Dairy Herd Improvement.  
Distribution of Dairy Cattle.  
Feeding Dairy Cattle.  
Breeding Dairy Cattle.  
Silage Flavors in Milk  
Cleaning Milking Machines.  
Mold in Butter.  
Whipping Quality of Cream.  
Dairy Statistics.  
Milk Pasteurization.  
Dairy Cattle Management.  
Condensed and Evaporated Milk.  
The Use of Dairy Products on Farms.  
The Little Theater (Special)

Feeding Dairy Calves.  
Scenic Booth - What Cow Testing Revealed.  
Scenic Booth - Holstein Cattle.  
Scenic Booth - Guernsey Cattle.  
Scenic Booth - Ayrshire Cattle.  
Scenic Booth - Brown Swiss Cattle.  
Scenic Booth - Jersey Cattle.  
The Value of Purebred Sires.  
Cooperative Dairy Marketing.  
Quality in Dairy Products.  
Essentials for Successful Marketing.  
Dairy Marketing Statistics.  
International Trade in Dairy Products.  
Market Reports on Dairy Products.  
Cost of Milk Marketing.

The following is a brief description of the subject matter in each of the booths listed:

Dairy Herd Improvement.

In this booth the Department of Agriculture calls attention to the need for improving dairy cows. It is pointed out that dairy cows furnish a constant market for feed; that high-producing dairy cows are a good and constant market for feed; and that in purebred high-producing dairy cows the farmer has a double market---through sales of milk and sales of purebred calves. The value of cow testing in improving the dairy herd is emphasized in a panel entitled "Listening In on the Dairy Herd," in which a farmer is shown to be determining the true value of each of his cows through the use of the Babcock tester and milk scales.

Distribution of Dairy Cattle.

The 1920 United States census figures on dairy cattle are a mine of useful information. This information is presented in a form which is easily and quickly comprehended. By a series of colored maps, the following information is brought



# DEPARTMENT OF AGRICULTURE BUREAU OF DAIRY CATTLE EXHIBIT ON DAIRY CATTLE, EXHIBIT AT THE NATIONAL DAIRY EXPOSITION 1922

## SUBJECT MATTER

To further the development of the dairy industry by bringing new and better information to dairy farmers, manufacturers, investors, and consumers, the purpose of the 1922 Dairy Exhibit, presented by the United States Department of Agriculture, is educational, and covers the field of dairying in the preceding and leading of dairy cattle in the United States and the use of the finished dairy products. It is intended primarily for use of dairy men and other exhibitors where large numbers of people interested in dairying may be reached.

The exhibit is made up of 35 units or booths, each booth dealing with one phase of dairy farming, manufacturing, or marketing. The titles of the various booths are as follows:

<p>Booth 1 - Dairy Farm Improvement Booth 2 - Distribution of Dairy Cattle Booth 3 - Feeding Dairy Cattle Booth 4 - Breeding Dairy Cattle Booth 5 - Dairy Farm in Mill Booth 6 - Cleaning and Milking Machines Booth 7 - Field in Dairy Booth 8 - Raising Quality of Cream Booth 9 - Dairy Statistics Booth 10 - Dairy Farm Management Booth 11 - Dairy Cattle Management Booth 12 - Condensed and Evaporated Milk Booth 13 - The Use of Dairy Products on Farms Booth 14 - The Little Theater (Special)</p>	<p>Booth 15 - Feeding Dairy Calves Booth 16 - Dairy Farm - What You Talking About Booth 17 - Holstein Cattle Booth 18 - Guernsey Cattle Booth 19 - Ayrshire Cattle Booth 20 - Brown Swiss Cattle Booth 21 - Jersey Cattle Booth 22 - The Value of Purified Cream Booth 23 - Cooperative Dairy Marketing Booth 24 - Quality in Dairy Products Booth 25 - Facilities for Specialized Marketing Booth 26 - Dairy Marketing Statistics Booth 27 - International Trade in Dairy Products Booth 28 - Market Reports on Dairy Products Booth 29 - Cost of Milk Marketing</p>
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The following is a brief description of the subject matter in each of the booths listed:

## Dairy Farm Improvement

In this booth the Department of Agriculture calls attention to the need for improved dairy cows. It is pointed out that dairy cows furnish a constant market for food, that high-producing dairy cows are a good and constant market for food, and that in general high-producing dairy cows are larger and more marketable through sales of milk and sales of purified cream. The value of cow testing in improving the dairy herd is emphasized in a panel entitled "Dispersing in on the Dairy Herd," in which a farmer is shown to be determining the true value of each of his cows through the use of the Babcock test and milk scales.

## Distribution of Dairy Cattle

The 1922 United States census figures on dairy cattle are a mine of useful information. This information is presented in a form which is easily and quickly comprehended. By a series of colored maps, the following information is presented:



out: - Average yearly production of cows in each county in the United States: Percentage of dairy sires purebred in each State: Percentage of dairy cattle which are purebred: Average number of cows per purebred bull: Number of dairy farms per purebred bull. The maps show very strikingly that the States which have the highest percentage of purebred dairy bulls are the States with the largest average yearly milk production per cow.

#### Feeding Dairy Cattle.

Investigations in the cost of milk production, carried on by the Department of Agriculture, show that in the cost of feeding dairy cows there is a danger line beyond which no dairyman can pass without risking a loss. There is a dead line beyond which a loss is almost certain. The danger line is 50 cents spent for feed for each dollar's worth of milk produced. The dead line is 65 cents spent for feed for each dollar's worth of milk produced. In addition to emphasizing the importance of economical feeding, the exhibit shows how this may be accomplished. Interesting relationships between various factors of production, which show definitely the greater earning power of high-producing cows, are also presented.

#### Feeding Dairy Calves.

What shall we feed the calves? Realizing that this is an important question on many farms, the Department of Agriculture has presented results of experiments in calf feeding which were recently completed at the dairy experiment farm. In one section of the exhibit there is shown a calf meal which has been found to be a satisfactory substitute for whole milk in calf feeding. This will be of special interest to dairymen producing market milk. In regions where skim milk is plentiful, however, the problem is one of how much skim milk should be fed to produce the greatest gains. Results of experiments in which calves were fed daily amounts of skim milk equal to  $1/7$ ,  $1/6$ , and  $1/5$  of their body weight, are shown in this exhibit. The effect of feeding skim milk warm, cold, and alternately warm and cold is also shown and the feeding value of sour milk is discussed.

#### Dairy Cattle Management.

What effect have advanced-registry conditions on milk and butterfat production? The answer to the question will be found in this booth. The increase in milk production due to handling cows under advanced-registry conditions as compared with ordinary-herd conditions ranges from 50.1 per cent to 77.9 per cent; butterfat production from 37.7 per cent to 91.2 per cent. The value of some of the separate factors of advanced-registry conditions is also shown. Milking three times a day as compared with twice a day increased milk production 11.9 per cent. Milking four times a day as compared with three times increased milk production 6.6 per cent. Box stalls caused an increase in production of 5 per cent as compared with stanchions. Exercise was shown to increase slightly the production of butterfat and to increase the consumption of feed.



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### Silage Flavors in Milk.

With the increasing use of silage on many farms the problem of producing milk free from silage flavors and odors has become of considerable importance. Experiments carried on by the Department of Agriculture and outlined in this booth, show that silage fed soon after milking has the least effect on milk flavors and odors. Silage fed one hour before milking gives considerable flavor and odor to the milk. Aeration of milk is an important factor in reducing the degree of flavors and odors, especially when the milk is aerated while still warm.

### Cleaning Milking Machines.

A simple but effective method of cleaning and sterilizing milking machines is presented in this booth. This method, which may be described as the hot water method of cleaning and sterilizing, was found to be very effective on a large number of farms where it was used. On one group of farms this method caused a reduction of the bacteria count from 257,900 to 19,300. Each of the ten steps in cleaning machines is made clear by means of enlarged illustrations and descriptive text.

### Use of Dairy Products on Farms.

In connection with educational Milk-for-Health campaigns which have been conducted in many sections of the United States, surveys made in the schools reveal that from 15 to 25 per cent of the school children are seriously undernourished. A report from a typical agricultural county in the Middle West indicates that one out of every 6 rural school children is seriously undernourished. As a remedy for this condition the exhibit suggests the use of milk in the school lunch, and points out the value of regular weighing and measuring of school children as a means of awakening interest in health and good food habits. A greater use of milk is also advocated for grown men and women.

### Breeding Dairy Cattle.

In connection with the Department's extensive dairy cattle breeding experiments, studies have been made of advanced-registry data with regard to its bearing on certain breeding principles. It has been shown, for instance, that because a sire is prepotent for some factor such as pretty heads or markings, it does not follow that he will be prepotent for other factors such as large milk and butterfat production. In fact it has been shown that different sires may be prepotent in the following ways: (1) Increasing both milk and percentage of butterfat of their offspring: (2) Increasing milk production, decreasing percentage of butterfat: (3) Increasing milk production, increasing butterfat percentage: and (4) Decreasing both milk production and butterfat percentage. The exhibit also shows that productive capacity is developed by handling and feeding cows under test conditions. Studies of the Holstein-Friesian records also show that nearly all of the Holstein cattle in the United States are descended in a direct male line from five sires.







### Whipping Quality of Cream.

Experiments on the whipping quality of cream show that the following factors have an important bearing on whipping quality: age, temperature, pasteurization, and homogenization. Age improves the whipping quality; temperature also is an important factor and the whipping quality increases as the temperature goes down. Pasteurization has a slightly detrimental effect on whipping quality. Homogenization decreases the whipping quality; and pasteurization and homogenization combined practically destroy the value of cream for whipping purposes. Other information on whipping quality is presented in this booth.

### Mold in Butter.

There is probably no one trouble that causes butter dealers so much annoyance or creameries so much loss as the growth of molds on the inside of butter tubs. While there are many sources of contamination, scientific studies have shown that the prevention of mold is comparatively easy, demanding only the application of heat, some simple remedies, and the general rules of sanitation. The effect of several methods of treatment now in use are shown in this exhibit, including the following one which gives satisfactory results: Tubs soaked and steamed for 30 seconds and then paraffined and coated with salt; liners left in saturated solution of boiling brine for 30 minutes. Under the supervision of the United States Department of Agriculture several million pounds of butter were packed in tubs and liners and treated according to this method and in no case was mold reported.

### Condensed and Evaporated Milk.

Little work has been done by public institutions on the many problems that perplex the manufacturer of condensed and evaporated milk. In the past few years the dairy laboratories of the Department of Agriculture have been investigating some of these questions, and the exhibit on this subject shows the nature of these investigations as well as the commercial equipment which is available for experimentation. The factors which influence the temperature at which curd is formed in sterilized evaporated milk is one of the questions investigated; and the exhibit shows how coagulating temperature is lowered by the growth of certain kinds of bacteria. In another part of the exhibit it is shown that milk forewarmed at low temperatures has only a slight tendency to thicken, while milk forewarmed near the boiling point is much more likely to become thick. Forewarming above the boiling point, however, greatly reduces the tendency to thicken.

### Milk Pasteurization.

What is pasteurization? How does it affect milk? In an exhibit on this subject the department answers these questions and shows its effect on the vitamins, chemical composition, and bacterial flora of milk. The chemical composition is not affected, and only one of the vitamins (water-soluble C) is either weakened or destroyed. Milk properly pasteurized sours normally. Very striking evidence of the need for pasteurization is also presented. This was an accidental





human experiment which showed the value of pasteurization as a safeguard against typhoid fever. That pasteurization is increasing is brought out by means of charts showing the percentage of cities which pasteurized more than one-half of their milk supply in 1915 and of those which did so in 1921. This chart brings out very forcefully the great increase in the amount of pasteurization. Other figures and important facts are presented on this subject.

### Dairy Statistics.

"There is still room for improvement in the United States in two respects at least. We could use more purebred dairy cattle and we could eat more cheese," says the exhibit on Dairy Statistics. According to this booth grade and scrub cattle outnumber purebreds in the United States by 30 to 1. It is also shown that in the consumption of cheese, the United States ranks low, with an annual per capita consumption of only 3.8 pounds. This is a poor showing compared with Switzerland, whose per capita consumption is 26.4 pounds. Studies of dairy statistics have brought out interesting comparisons which are presented in the form of charts. One of these charts shows that while the number of cows in the United States per 1000 population has decreased, the production of milk per capita has actually increased. This is due to better cows.

### Value of Purebred Sires.

It has long been realized that purebred livestock excel ordinary and scrub livestock from a utility standpoint, but little has been done to measure the degree of superiority. To obtain information on this point the U. S. Department of Agriculture conducted an inquiry involving 25,000 head of breeding stock, the results of which are presented in this exhibit as follows:

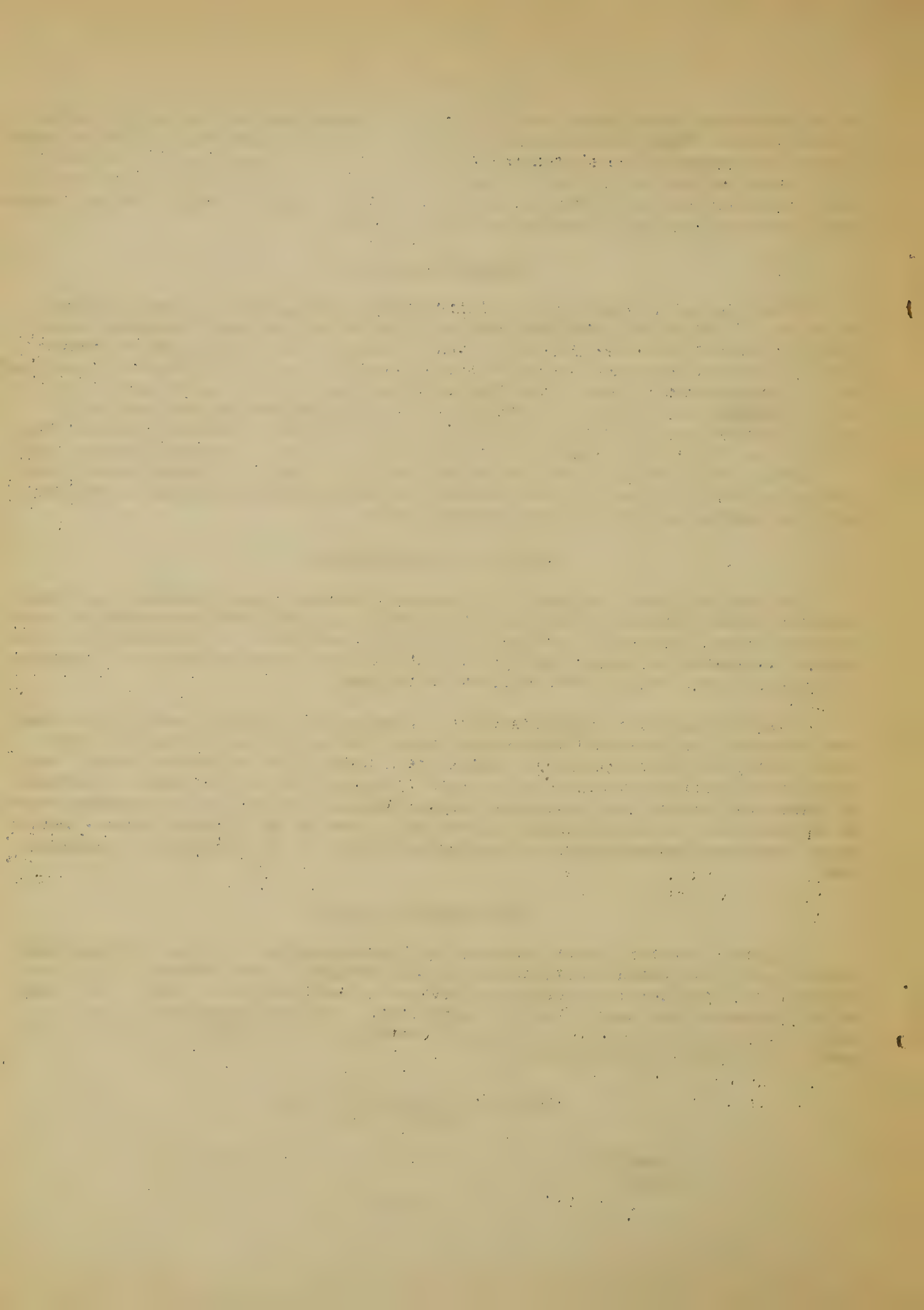
Purebred livestock has about 40 per cent greater earning power (apart from its breeding or sale value) than scrub stock. The offspring of purebred sires bring nearly 50 per cent greater returns than those of non-purebred sires. The greatest superiority is noted in the case of dairy cattle. The average increase in financial returns from livestock-raising traceable to the use of purebred sires is 48 per cent. These facts and figures are a part of the "Better Sires - Better Stock" movement conducted by various States and the U. S. Department of Agriculture.

### The Little Theater.

A little theater, which consists of a standard-size booth so arranged that movies may be projected in it, is one of the features of the exhibit. The film shown in this theater is an animated cartoon approximately six minutes in length which emphasizes the need of better dairy sires. While presented in a more or less humorous style, the film brings out forcefully the value of a good purebred bull in improving the dairy herd.

### Better Cattle - Better Farms. Scenic Booths.

- |                |             |
|----------------|-------------|
| 1. Brown Swiss | 3. Holstein |
| 2. Jersey      | 4. Ayrshire |
| 5. Guernsey    |             |





These five booths, which represent five good dairy farms, each typical of a certain section of the country, with model cows and life-like painted panoramic backgrounds, emphasize the need for better cattle and better farms and homes. The purpose of these exhibits is to arouse the interest of dairymen in making farm buildings more modern and convenient and homes more comfortable and attractive. The well arranged farms and the buildings of approved type serve to show what can be done toward making farm life what it should be.

The better herds shown on these farms are the key to the situation. Better feeding and selection, of course, raise the production of the herd to a certain level; but beyond this further progress is impossible without skill in breeding. The use of better dairy bulls is the quickest and most economical means of improving dairy herds---and for those who cannot afford one the cooperative bull association is suggested as a means of obtaining the use of good purebred bulls at a small cost. Another point emphasized is the need of making farm life more attractive in order to keep the boys and girls on the farm.

#### What Cow-testing Revealed. Scenic Booth.

How one cow which was the average cow in a herd of 16 produced more income above her feed cost than all of the 91 cows in another herd is shown in this booth. This astonishing fact was revealed by a cooperative cow-testing association which has for its purpose the detection and eradication of unprofitable cows and the more economical feeding of the cows that remain.

The facts in this particular case are brought out pictorially by means of a scenic reproduction of the cows involved with the farms on which they were found as backgrounds. A condition similar to the one depicted probably exists in many other localities and as shown by this exhibit a cow-testing association would bring such conditions to light.

#### Cooperative Dairy Marketing.

"Cooperative marketing succeeds when fundamentals are observed," according to this exhibit, which presents in brief form the principles of successful cooperation in marketing. "Strength lies in united effort. Confidence is produced by efficient management and economical service."

"The ultimate success of any cooperative marketing effort depends on the will of the farmer to cooperate, on a spirit of mutual confidence, and on trust in one another."

"No farmers' organization can continue to live which is managed arbitrarily. It is likely to succeed only as the members develop a living active spirit of mutual effort, which must be manifested in the board of directors."

#### Quality in Dairy Products.

In this booth the value of quality in dairy products is emphasized by showing that quality brings higher prices to producers, increased demand to manufacturers, larger sales to distributors, and greater satisfaction to consumers. Quality begins with the producer, according to the exhibit, and each year the





producers lose \$25,000,000 on account of poor quality. Some of the factors, sanitation, cooling, and frequent delivery, are brought out. Quality results in increased consumption of products because discriminating consumers appreciate quality and insist on getting it. The problem of the dairy industry is not overproduction but underconsumption.

### Essentials for Successful Marketing.

As shown pictorially in this exhibit, the four main essentials for successful marketing are: organization, which provides facilities for marketing; standardization, which unifies quality and facilitates trading; merchandizing, which holds trade and encourages demand; and advertising, which stimulates use and stabilizes demand. Organization, the first essential, demands adaptability, adequate financing, capable management, and the complete records so necessary for efficient management. The third factor, merchandizing, requires salesmanship to promote confidence and increase sales, service which is continuous and dependable, products of good quality, and prices intelligently adjusted to conditions of supply and demand.

### Dairy Market Statistics.

The United States is a great dairy country and, as shown in this exhibit, it takes little distortion of the United States map to make it look like Uncle Sam's dairy cow, which produced more than 11 billion gallons of milk during the year 1921. How this great supply of milk is utilized is shown by means of a pictorial chart which shows that 45.7 per cent of it is consumed as milk and cream, 22.4 per cent as creamery butter, 13.8 per cent as farm butter, 4.3 per cent as feed for calves, and about 3.5 per cent each as condensed milk, cheese, ice cream, and miscellaneous uses including waste. In another part of the exhibit is represented the movement of butter to the principal markets in the United States during 1921, showing in what States and in what quantities the supplies of the various city markets are produced. Similar information is presented on the movement of cheese.

### Market Reports on Dairy Products.

This booth pictures the market news service on dairy products maintained by the Department of Agriculture, enumerates the offices at which reports are issued, and points out the method of distributing the market reports and the use of market information. The market reports which include butter and cheese cover the wholesale markets at New York, Chicago, Boston, Philadelphia, and San Francisco, and the primary cheese markets of Wisconsin. In addition to the daily and weekly reports on butter and cheese, monthly reports are issued from Washington on milk market prices, and condensed, evaporated, and powdered milk prices.

### International Trade in Dairy Products.

This booth pictures the sources of supply and the relative amounts of butter and cheese received on the English market from forty countries before and after the war, thus bringing out the shift which has taken place in the great sources of supply. The booth also shows pictorially the balance of trade in dairy products expressed as imports and exports. This is shown by means of a "World's milk pool"





into which milk flows from exporting countries and from which milk flows to importing nations. In connection with these studies the need for greater knowledge of world conditions of supply and demand is emphasized.

Costs of Milk Marketing.

In this booth will be found information on a number of important items of cost in the distribution of milk by milk dealers; it should prove especially interesting to those engaged in that business. In a graphic way are shown the effects of plant depreciation, labor costs, investment costs, collection costs, and delivery expenses in the distribution of milk in cities.



### CONSTRUCTION OF THE EXHIBIT

Space Required. Each booth requires approximately 100 square feet of floor space, exclusive of aisles. The exhibit can be arranged to fit various shapes of floor space.

Weight. Each booth weighs approximately 500 pounds.

Construction. The booths are standardized as to size and construction and are so made that they can be taken apart and packed away in a comparatively small space. When the exhibit arrives the parts will be found packed in crates, the three sections of each booth in a separate crate, and the front and back posts and other minor parts packed in other boxes. The various parts can be assembled into booths by hooking together,

### Directions for Installing the Exhibit

Before the exhibit material is delivered on the floor space, a diagram should be made showing the location of each booth on the floor, or the location may be marked with chalk on the floor. When each crate or box is brought in it should be placed nearest the place its contents are to be set up.

### Setting up the Standard Booths;

Standard booths are easily and quickly set up. Three men can unpack and set up from 3 to 5 booths per hour. The parts of the booth and the positions they should occupy are shown in the illustrations which follow. All back posts and columns are standardized so that they may be used interchangeably. The sections are marked on the end surfaces with one of the three letters, L, C or R, which indicates, left, center or right position in the booth.

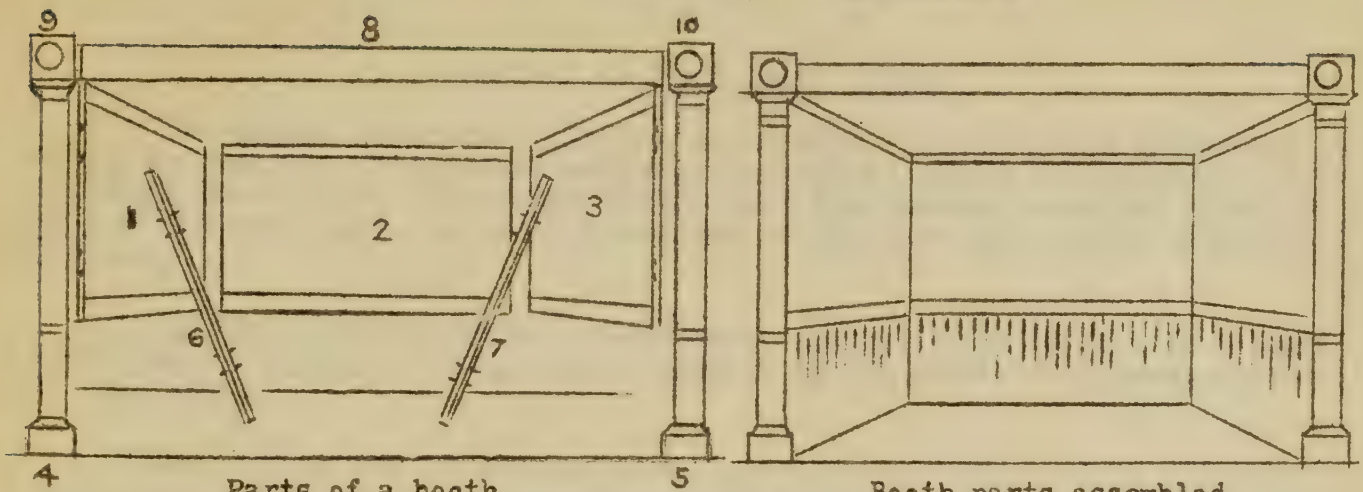
The parts of the booth are fastened together with hooks and sockets similar to bed hooks. When the three sections, two back posts and two front columns have been hooked together the tie bar should be attached. The same operation is then completed for the next booth in the line, always working from one end toward the other, (where three or more booths are on one line), rather than starting work at both ends. When all booths have been set up to the extent stated, the blocks carrying the Department seals should be attached to the top of the front columns with screws. Brass screwhooks are then attached along the undersides of the sections to hold the rods. The rods are then inserted into the hem of the burlap and the burlap gathered on the rods, after which the rod are hung on the hooks.





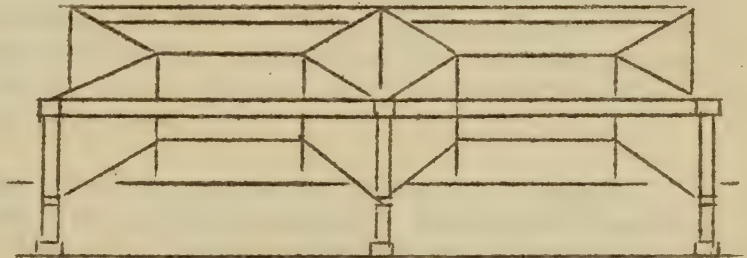
# METHOD OF SETTING UP STANDARD BOOTHS

Office of Exhibits  
U. S. Department of Agriculture

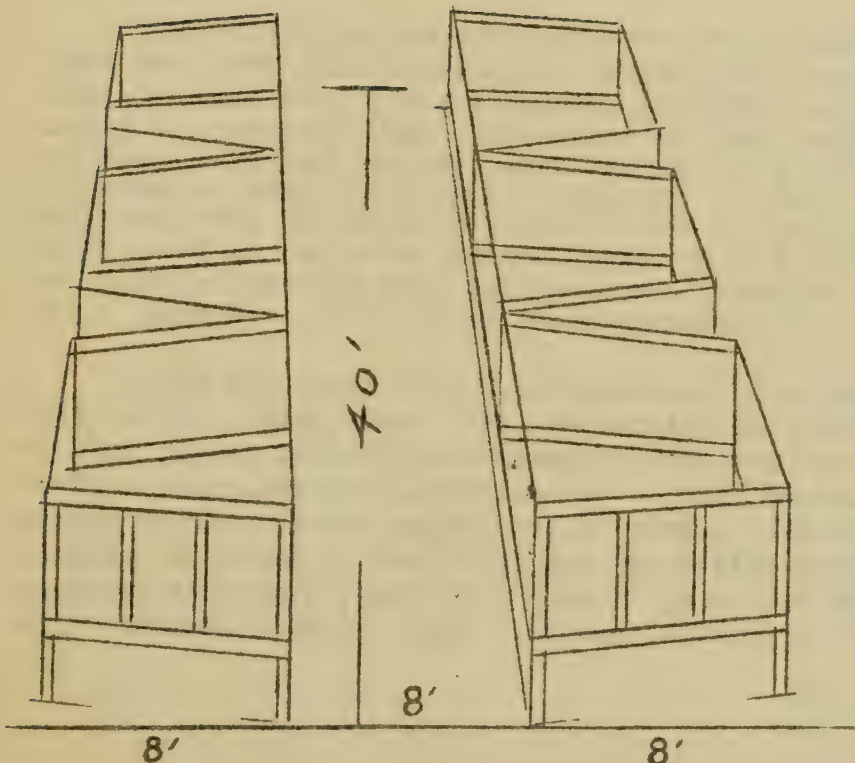


- Parts of a booth
1. Left section
  2. Center section
  3. Right section
  - 4 and 5. Front columns
  - 6 and 7. Back posts
  8. Tie bar
  - 9 and 10. Dept. seals

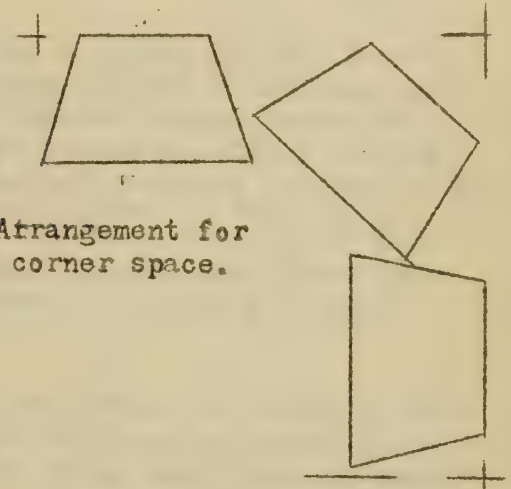
Booth parts assembled



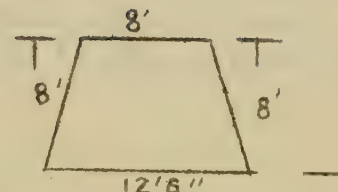
Pleasing arrangement for center of hall,  
booths set back to back.



Arrangement where aisle in center  
is desired.



Arrangement for  
corner space.



Floor plan of booth.

Office of Experimentation  
U. S. Department of Agriculture



Fig. 1. Greenhouse.

Fig. 2. Greenhouse.

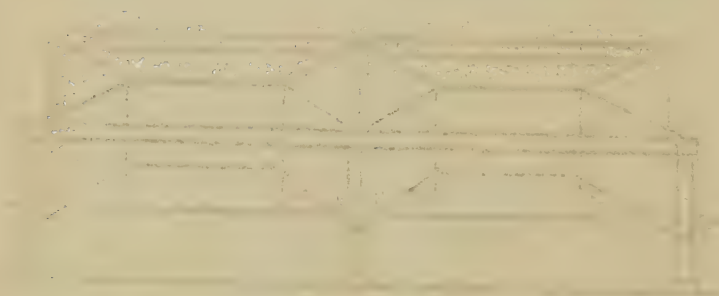


Fig. 3. Greenhouse.

Fig. 4. Greenhouse.

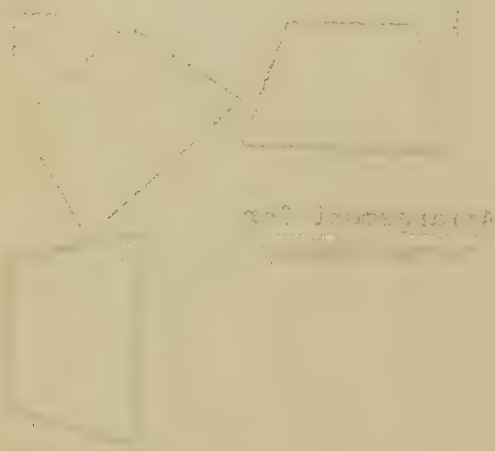


Fig. 5. Greenhouse.



Fig. 6. Greenhouse.



### Setting up the Scenic Booths.

The Jersey, Guernsey, Ayrshire, Brown Swiss, and Holstein scenic booths, which are designed to be shown as a unit, should be set up according to the following directions. (The scenic booth "What Cow-testing Revealed" also may be set up according to the same directions except that the scenery front is omitted.)

The five booths require a floor space approximately 65 feet by 8 feet. Three electric plugs are required to connect up the electric lighting system of the booths.

Mark off on the floor with chalk line the exact space to be occupied by the booths. Each booth is approximately 12 feet 8 inches across the front and 8 feet in depth. If the booths are to be set up close to a wall at least a foot and a half should be left between the back of the booths and the wall to enable a person to pass between the two. This is necessary in order that lighting plugs may be connected and disconnected and for other purposes. Starting at the left (left of an observer standing in front of and facing the booths) number the spaces from 1 to 5. When the crates containing the various parts of the booths are brought in they should be so placed that the material for each booth will be near its intended location.

The illustrations which follow show the separate parts of a scenic booth in their relative positions but not hooked together. They also show how the booth floor is held in place by the iron hooks which are to be attached to the different sections before these sections are hooked into place. These hooks cannot be attached conveniently, and in some cases not at all, after the sections have been hooked in place. The framework of the assembled scenic booth is also shown.

In setting up the scenic booths start with No. 1. After the No. 1 sections have been removed from the crates, the iron hooks should be attached to them. Columns Nos. 1 and 2 and the two back posts labeled "scenic booth No. 1" should be unpacked. The three sections, two back posts and two front columns may then be hooked together with column No. 1 on the left and No. 2 on the right. A tie bar is next set in place and then the two floor pieces are hung on the six iron hooks which are attached to the sections. The front portion of the booth floor is supported at the center with a V-shaped wooden leg. When booth No. 1 has progressed this far the same operation should be started on booth No. 2, then Nos. 3, 4, 5, in the order named.

When each booth has been completed this far they should be lined up carefully on the chalk line. The grass mats are then put in place and the pieces of blue tissue paper representing sky are hung on the wires which are stretched between the right and left sections of each booth. It will be noted that these strips of blue tissue paper vary in width. The wide strips should be placed towards the front of the booth and the strips made narrower and narrower as they approach the rear. About five rows of paper are necessary to shut out the light which otherwise would shine over the top of the booth.





and reach the observer's eye.

The next step is to attach the scenery fronts which are placed in front of the booths. The large pieces are numbered in accordance with the booth to which they belong. In placing the scenery start with No. 1 booth and work towards the right, finishing with No. 5. Hooks will be found on the back of the scenery which hook into eyes on the front of the booth columns. At the edges where two sections of scenery meet will be found hooks and bolts to hold them together. The larger pieces of scenery cover the fronts of five booths. The smaller pieces of scenery have been made to fit on top of this first row.

When the scenery has been secured in place the next step is to install the lighting equipment. It will be found that the strips of wood bearing the light sockets are numbered from 1 to 5 in accordance with the booths to which they belong. The wooden strips should be fastened in place on the back of the scenery stone wall and on the backs of the tie bars. It would probably be well to have an electrician inspect the installation of lighting equipment before the current is turned on.

The model cows may be put in place and the various placards arranged. The larger placards should be placed on the outside and the smaller ones set up on the inside. On the back of each placard will be found a number and name indicating the booth to which it belongs.

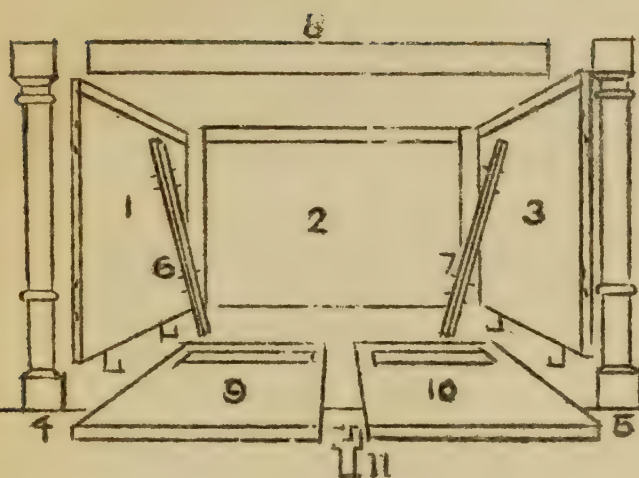
Among the material will be found a cow and bull of each of the five breeds mounted on composition board and painted. These animals with the placards bearing their names should be placed on the easels in front of the booths - (one on each side of the booth) to which they belong.





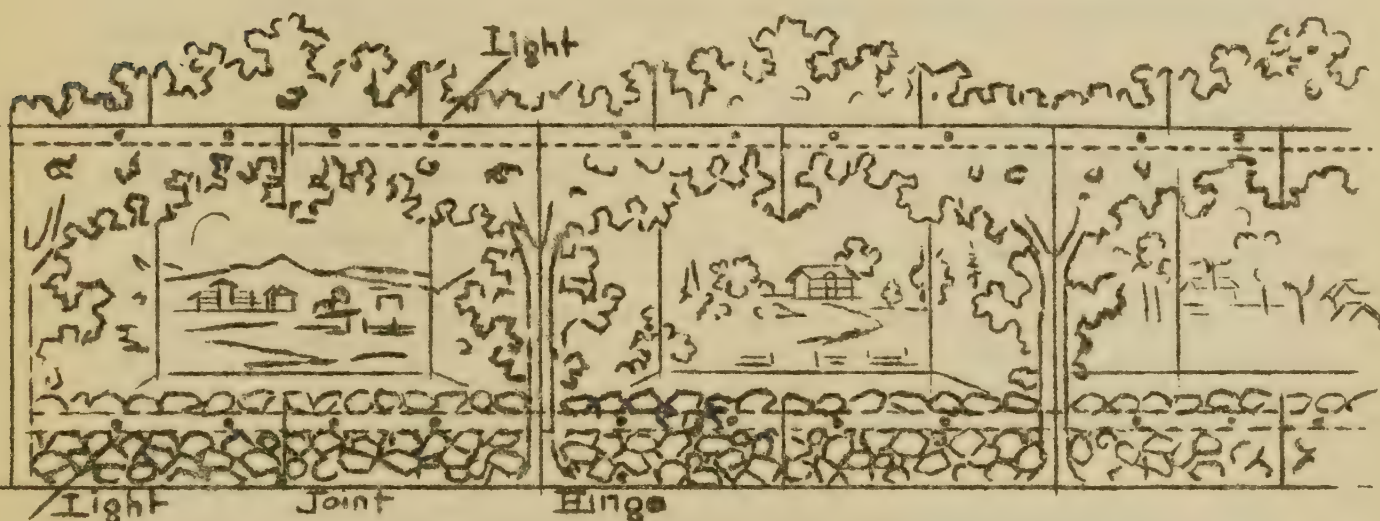
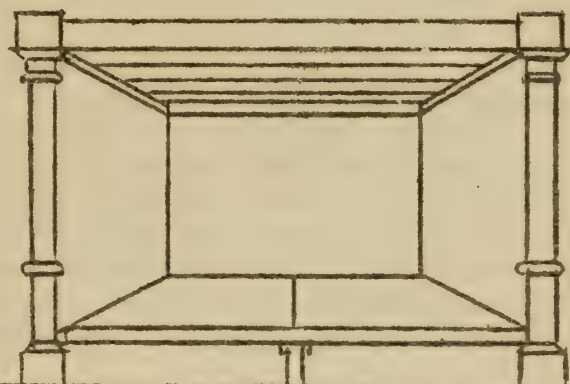
# DIRECTIONS FOR SETTING UP SCENIC BOOTHS

Office of Exhibits  
U. S. Department of Agriculture



- Parts of the scenic booth
- 1, 2 and 3 Background section
  - 4 and 5 Front columns
  - 6 and 7 Back posts
  - 8 Tie bar
  - 9 and 10 Floor
  - 11 Supporting legs

Parts of the scenic booth (framework)  
hooked together in their proper places.



Scenery which forms the front of the scenic booths. Dotted lines show position of wooden strips to which the electric lighting fixtures are attached.

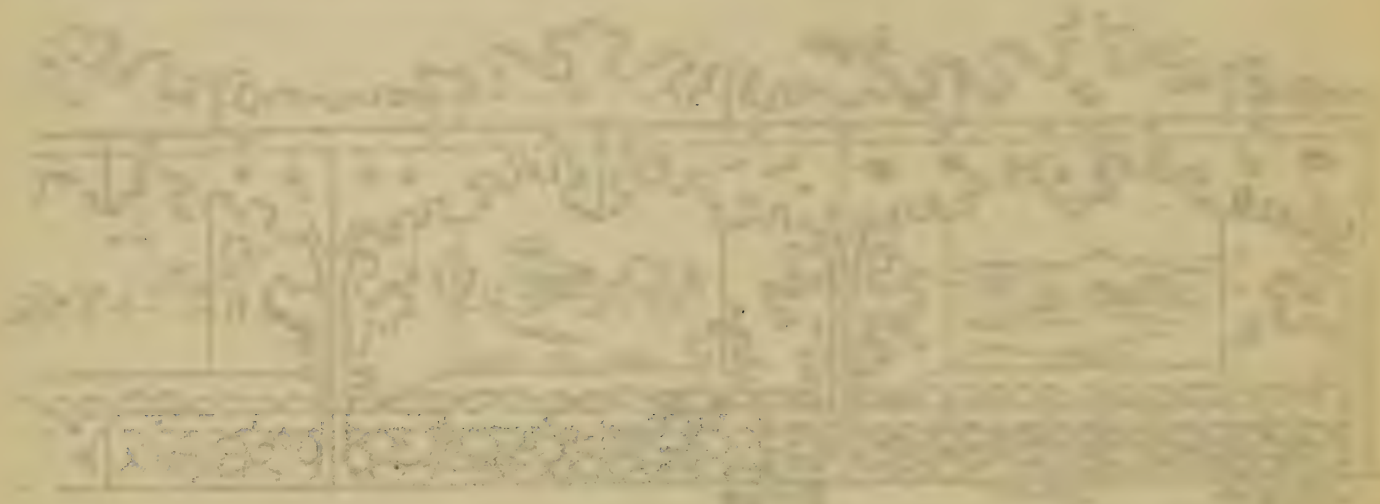


Arrangement of the five scenic booths, showing also the compo board animals which rest on easels in front of booths. The posts and chain keep visitors back 3 feet.

Section of the scenic point.  
 1. 2 and 3. Back ground section.  
 4 and 5. Snow peaks.  
 6 and 7. The sky.  
 8 and 9. The foreground.  
 10. The foreground.



Points of the scenic point (foreground)  
 marked together in their proper places.



Points which form the level of the scenic point. Dotted lines show points  
 of the horizon which are shown in the foreground.

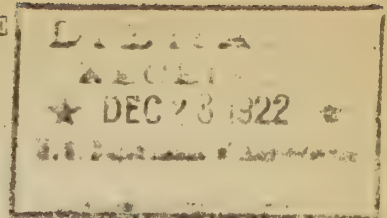


The points of the scenic point are shown in the foreground. The points of the scenic point are shown in the foreground.



UNITED STATES DEPARTMENT OF AGRICULTURE  
Dairy Exhibit, 1922.

MILK PASTEURIZATION.



What is pasteurization? How does it affect milk? An exhibit of the U. S. Department of Agriculture entitled "Milk Pasteurization" tells you about the process of pasteurization, how it safeguards milk, and how the pasteurization of milk has increased in this country.

Pasteurization is not an arbitrary term, but is the name given to a process of heating liquids. The name was given in honor of the work of Pasteur in 1864. As applied to milk, the primary object of pasteurization is the destruction of any disease germs which may be present. Three processes of pasteurization have been used in this country; the flash process, the holder or holding process, and pasteurization in the bottle. In the flash process milk is heated in from 30 seconds to 1 minute to a temperature of at least 160° F. It is then immediately cooled and bottled. This process is not used extensively in this country for the pasteurization of milk. The holder process consists of heating milk to 145° F. in tanks and holding it for 30 minutes, after which it is cooled and bottled. This is the process most extensively used in this country. Sometimes milk is bottled first and then heated to 145° F., held for 30 minutes, and then cooled in the bottle. This process, known as in-the-bottle pasteurization, has many points to commend it.

Pasteurization gives protection without injury to the milk, as is shown by the following facts.

It has practically no effect on the chemical composition of milk. In milk pasteurized at 145° F. for 30 minutes the albumen and globulin are not precipitated, and neither is there change in the soluble salts.

Milk pasteurized at 145° F. for 30 minutes sours normally, and does not decompose, as many believe it does. The proportion of acid-forming bacteria to the total number of bacteria is actually increased when milk is pasteurized in this way, and the milk sours as normally as raw milk of equivalent bacterial quality. This is not true of high-temperature pasteurization; but high-temperature pasteurization is no longer used to any great extent in this country.

Pasteurization has no effect on the vitamins fat-soluble A and water-soluble E. Water-soluble C is weakened or destroyed; but in the case of infant feeding this deficiency can be easily made up by the addition of orange and tomato juice. In the case of adults water-soluble C is amply supplied by green vegetables.

A very striking evidence of the value of pasteurization is shown in the center panel of the exhibit. This is an accidental human experiment which showed the usefulness of pasteurization as a safeguard against typhoid fever. The milk from one farm went to two cities. In one of these cities



1. The first part of the paper is devoted to a general discussion of the problem.

2. The second part is devoted to a detailed analysis of the results.

3. The third part is devoted to a discussion of the conclusions.

4. The fourth part is devoted to a discussion of the future work.

5. The fifth part is devoted to a discussion of the references.

6. The sixth part is devoted to a discussion of the appendix.

7. The seventh part is devoted to a discussion of the bibliography.

8. The eighth part is devoted to a discussion of the index.

9. The ninth part is devoted to a discussion of the table of contents.

10. The tenth part is devoted to a discussion of the list of figures.

11. The eleventh part is devoted to a discussion of the list of tables.

12. The twelfth part is devoted to a discussion of the list of references.

13. The thirteenth part is devoted to a discussion of the list of figures.

14. The fourteenth part is devoted to a discussion of the list of tables.

15. The fifteenth part is devoted to a discussion of the list of references.

16. The sixteenth part is devoted to a discussion of the list of figures.

17. The seventeenth part is devoted to a discussion of the list of tables.

18. The eighteenth part is devoted to a discussion of the list of references.

19. The nineteenth part is devoted to a discussion of the list of figures.

20. The twentieth part is devoted to a discussion of the list of tables.

the milk was sold raw and in the other it was pasteurized. In the city which had the raw milk 12 cases of typhoid fever developed which were traced to the milk from that farm, but no cases developed in the other city where the milk from the same farm was pasteurized. Investigation brought out that a milker on the farm had typhoid fever and infected the milk. Pasteurization saved one city from an epidemic.

Such evidence as this, of the value of pasteurization, accounts for the remarkable increase in its use, as shown by charts in the third panel of the exhibit. As an illustration take New York City. In 1903 about 5 per cent of the milk supply of New York was pasteurized; in 1912, about 40 per cent; in 1914, about 88 per cent; and in 1921, 98 per cent. The extent of pasteurization is equally striking in the smaller cities. Figures in 1921 from 88 cities of less than 10,000 population showed that in 22 of them 50 per cent of the milk was pasteurized; in 12 others, from 11 to 50 per cent of the milk. Some cities require the pasteurization of all milk except certified or equivalent grades. Experience with pasteurization may be summed up as follows:

1. No epidemics have been traced to properly pasteurized milk.
2. Proper pasteurization destroys the pathogenic organisms sometimes found in milk.
3. After pasteurization, milk is handled by so few people before it reaches the consumer that it can be protected against further infection by frequent medical inspection of the small number of people concerned.
4. Tuberculin testing properly used is a safeguard against bovine tuberculosis, but does not protect against typhoid fever, diphtheria, septic sore throat, and other milk-borne diseases. This emphasizes the need for pasteurization.
5. Pasteurized milk sours like new milk of equivalent bacterial quality.
6. The only change in milk caused by pasteurization is the reduction of vitamin C. This deficiency is easily supplied by feeding tomato or orange juice.
7. Pasteurization is increasing each year.

For further information send for U. S. Department of Agriculture Bulletin 342, The Present Status of the Pasteurization of Milk.



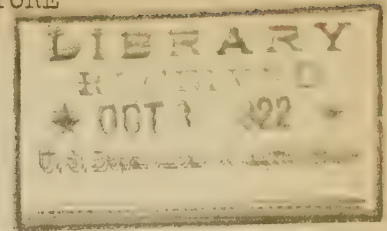


Ex-104

UNITED STATES DEPARTMENT OF AGRICULTURE

DAIRY EXHIBIT, 1922

CONDENSED AND EVAPORATED MILK



Little work has been done by public institutions on the many problems that perplex the manufacturer of condensed and evaporated milk.

In the past few years the laboratories of the Dairy Division have been investigating some of these questions and the exhibit on this subject is designed to show the nature of these investigations and some of the equipment available for the work.

In sterilizing evaporated milk the manufacturer is obliged to heat the finished product to a temperature sufficiently high to destroy all bacteria. At the same time it must not be heated high enough to produce a hard curd which will detract from the appearance or palatability of the product.

The factors which influence the temperature at which this curd is formed is one of the questions being investigated. As one of the charts in the exhibit shows the coagulating temperature is lowered by the growth of certain kinds of bacteria. This is particularly true of the bacteria which increase the acidity of the milk. The extent and method of forewarming the milk before it is drawn into the pan also has an effect on the coagulation.

In making sweetened milk one of the serious difficulties encountered is the thickening which takes place, sooner or later, in all condensed milk. The exhibit shows that milk forewarmed at low temperatures has a low viscosity and only a slight tendency to thicken, while milk forewarmed at near the boiling point is much more likely to become thick. If, however, the temperature of forewarming is raised above the boiling point the tendency to thicken is greatly reduced.

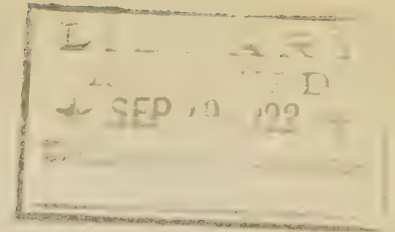
The equipment for the work on condensed and evaporated milk includes, in addition to the bacteriological and chemical laboratories, a miniature factory in which all the factory operations can be carried out on a small scale. At the Grove City, Pa. creamery there is a complete small-scale commercial unit for making both condensed and evaporated milk, operated by the Dairy Division. In this plant new methods are tested before the results are made public. This equipment is shown in the exhibit by means of a model of the plant.



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B-4 Dd

UNITED STATES DEPARTMENT OF AGRICULTURE  
Dairy Exhibit, 1922.

WHAT COW TESTING REVEALED.



About three years ago, in a dairy community of an Eastern State, a cow testing association was organized. The records from this association which reached the Dairy Division of the United States Department of Agriculture revealed a situation with regard to one dairy farm which was both amazing and deplorable. Happily the situation with regard to this farm has now been corrected; but the Department of Agriculture, by means of an exhibit on this subject, is presenting the facts in the case as an aid to other dairymen who unknowingly may be in the same position in which this man found himself.

This dairyman, who may be called Mr. A was feeding and milking 91 cows which were largely grades and apparently of average quality. He believed he was doing very well in the business. An analysis of the records, however, showed that for an entire year each of his cows had produced an average income of only 64 cents above their feed cost. For the entire 91 cows the total income above feed cost was \$58.24.

On another farm in the same community was a herd of 16 cows. The records from this herd showed that on an average each cow in the herd produced during the year an income of \$74.92 above her feed cost.

Here, then, were two herds, the average cow in one herd producing more income above feed cost than all the 91 cows in the other herd. In fact, it would have required 1873 cows like the 91 in the first herd to produce as much income above feed cost as the 16 cows in the second herd.

The owner of the 91 cows was astonished, as well he might be. His cow testing association records showed him that 23 of his cows were unprofitable. He got rid of them. The records also showed that each cow had been getting the same quantity of feed regardless of how much milk and butterfat she gave. He remedied that also. He is making a good profit now on the 68 remaining cows and much less labor is required. Last year the average income from each cow above her feed cost increased to \$89. He is now giving attention to breeding better cows and it is probable that in time he will have a very profitable herd. All these things, which are merely business principles applied to dairying, are taught by the cow testing association.

What would a cow testing association reveal and correct, in your community? On your farm? Do you know what your cows are doing?





1 1

UNITED STATES DEPARTMENT OF AGRICULTURE  
Dairy Exhibit, 1922.

STATISTICS OF DAIRYING.

There is still room for improvement in the United States, in two respects at least. We could use to good advantage a great many more pure-bred dairy cattle, despite the fact that we have too many cattle of inferior sorts. And we could eat more cheese. These facts are illustrated in the exhibit on dairy statistics presented by the Dairy Division of the Department of Agriculture.

"There is still a lot of room for purebred dairy cattle in the United States", says this exhibit. This statement is based on the 1920 United States census figures which show that relatively the number of purebreds in this country is small. In fact, the scrubs and grades outnumber the purebred dairy cattle by 30 to 1. As shown in the exhibit, Uncle Sam in the roll of census taker, has found that there were 31,364,459 scrubs and grades and only 916,602 registered purebreds.

In a panel entitled "The Slighted Guest at the Worlds Cheese Banquet" opportunity for extending the dairy industry of this country through the consumption of greater quantities of cheese is emphasized. Uncle Sam with an annual consumption of only 3.8 pounds of cheese per capita is shown to be at the "foot of the table" in this respect. Switzerland ranks first with 26.4 pounds per capita, followed by Netherlands with 13.3 pounds, Denmark 12.3 pounds, United Kingdom 11.2 pounds, Germany 9.5, France 8.1 pounds, Norway 7.1 pounds, Australia and Italy 4.8 pounds each, and the United States 3.8 pounds.

If we ate as much cheese as the Englishman, the German, the Dutchman, the Frenchman, or the Dane, or one half as much as the Swiss, the additional amount of milk required would be 9,000,000,000 pounds per year.

Studies of Dairy statistics have brought out some interesting comparisons which are presented in the form of charts.

One of these studies showed that while the number of cows in the United States per 1000 population had decreased from 278 cows in 1850 to 221 cows in 1922, the amount of milk produced per capita had actually increased during that time due to the fact that the yearly milk production of the cows had increased during the same period from 1436 pounds the year 1850 to 3945 pounds in 1922.

Another chart which shows the production of creamery butter and of farm butter from the year 1850 to 1922, brings out the fact that the production of farm butter is decreasing while creamery butter is increasing.

The price of butter follows the price of hay. This is shown by a graphical representation of these prices between the years 1913 and 1922.

The price of butter is also compared with the average price of all foods from 1913 to 1922. This comparison, which is based on wholesale prices, shows that the general trend is the same, but that butter does not go so high as the average of all other foods.





UNITED STATES DEPARTMENT OF AGRICULTURE.  
Dairy Exhibit, 1922.

FEEDING DAIRY COWS.

There is a danger line in the cost of feeding dairy cows beyond which no dairyman can pass without risking a loss. There is a dead line beyond which a loss is almost certain.

These facts were determined by the U. S. Department of Agriculture through a long time investigation of the cost of producing milk in six different dairy regions. The figures show that a cost of 50 cents for feed per each dollars worth of milk sold is the danger line. Of the 212 records of dairymen studied, 95 had feed costs below 50 cents. Approximately 88 percent of these made a profit. Of the 81 dairymen whose costs were between 50 cents and 65 cents, only 54 percent made a profit. Of the dairymen whose costs were above 65 cents only, 6 percent made a small profit while 94 percent of the farmers in this group suffered a loss. Sixty-five cents was therefore set as a dead line. These facts are brought out forcefully by means of a pictorial representation in which the close relation of feed costs to profits is emphasized.

Having pointed out the importance of economical feeding the exhibit shows how this may be accomplished. Four points are emphasized.

Feed Balanced Rations: Such rations put the cow in better physical condition, stimulate milk production and supply the different nutrients in proper proportion to meet the cow's needs in maintaining her body and for the production of milk and butter fat.

Feed Palatable and Succulent Rations. Cows thrive best on rations that are relished. They will consume more of such feed and therefore they can produce more. Succulence in the ration helps to take the place of pasture.

Feed the Right Amount.

1. Feed all the roughage the cow will eat up clean.
2. Feed one pound of grain per day for each three pounds of milk per day.
3. Feed all the cow will respond to in milk production.

Feed Low Cost Rations.

Feed home-grown roughages both dry and succulent. Improve the pastures, temporary and permanent. Feed home-grown concentrates at least in part. Consider carefully the comparative cost and feeding value of purchased concentrates.

In the exhibit there are also shown some interesting relationships between the various factors of production which show definitely the greater earning power of high-producing cows.

As butterfat production of a cow increases, the income returned above her feed cost rises at the rate of about \$15 for each increase of 50 pounds in butterfat. As the milk production of a cow increases from 1500 pounds a year to 6500 pounds the returns for each dollar's worth of feed rise from \$1.87 to \$2.55. These figures are based upon the yearly records of more than 21,000 cows, obtained during the period 1910 to 1920.



UNITED STATES DEPARTMENT OF AGRICULTURE

Dairy Exhibit, 1922.

A TALE OF TWO BULLS

This higher grade herd,  
This big milk flow  
How come? Ask me if you must know  
All due to one good bull.

With these words a good purebred bull which is the hero of a story presented by the United States Department of Agriculture in an animated cartoon, sums up his value in putting a dairy farm on a paying basis.

While treated in a more or less humorous vein--this movie, like a pill with a sugar coating, will be found to contain something very real underneath. It is hoped that it will succeed in pointing a way to better herds.

The story opens with Mr. Brown, a dairyman, working hard to make both ends meet but somehow they don't. His cows are not working for him, in fact, in the words of these cows:

"The life of a scrub is a go as you please  
We eat and we drink and sit at our ease,  
Who cares if the milk we give won't feed a cat  
We should worry, tra-la, let the farmer do that."

As things are going from bad to worse Mr. Brown visits a neighbor, Jim Moore, whose cows which give large quantities of milk have made him prosperous. An inspection of the mangers shows Brown that the feed is not the cause of the big milk flow as evidenced by his remark: "The feed is like mine, but just look at that flow, Where all that milk comes from, I'm darned if I know." The cause of the big milk flow, however, is standing nearby in the shape of a good purebred bull. Having seen evidence of the value of such a bull our dairyman dashes back to his farm and addresses his scrub bull, which is the cause of his poor herd, in the following unceremonious but nevertheless effective manner:

"Get off of this farm you good for nothing critter,  
Not one cow worth her keep in all your lazy litter."

His meaning is unmistakable and the bull leaves on the run. Having rid the farm of this pest, Mr. Brown buys a good purebred bull.

After several years have elapsed we are again allowed to look over the Brown farm -- What a change! Big producing cows -- boys



THE HISTORY OF THE  
CITY OF BOSTON

12

THE HISTORY OF THE  
CITY OF BOSTON  
FROM THE FIRST SETTLEMENT  
TO THE PRESENT TIME  
BY  
JOHN H. COLEMAN  
OF THE CITY OF BOSTON  
IN TWO VOLUMES  
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running with pails to carry away the big flow of milk and the whole farm reflecting prosperity. "All due to one good bull", as our hero modestly admitted at the beginning of this story.

As was pointed out, while this cartoon is treated in a light vein, it contains a real lesson. There are probably many dairymen in just such a position as Mr. Brown found himself before discovering a way out. A good purebred bull capable of increasing the production of daughters as compared with their dams should be a great help in solving the problem. For those who do not desire to purchase a bull for exclusive use on their farms, the Cooperative Bull Association offers an opportunity of obtaining the use of high grade bulls at a small cost. Ask your county agent, State Agricultural College or United States Department of Agriculture about the Bull Association.

The first part of the paper is devoted to a study of the  
 properties of the function  $f(x)$  which is defined by the  
 equation  $f(x) = \int_0^x f(t) dt$ . It is shown that this  
 function is continuous and differentiable, and that its  
 derivative is equal to  $f(x)$ . This result is then used to  
 prove that the function  $f(x)$  is the only solution of the  
 equation  $f(x) = \int_0^x f(t) dt$  which satisfies the  
 condition  $f(0) = 1$ .



UNITED STATES DEPARTMENT OF AGRICULTURE.

Dairy Exhibit, 1922.

BETTER FARMS THROUGH BETTER CATTLE.

"There is a way" for all dairymen who really want better herds and better farms, with more comfortable and convenient buildings, says the U. S. Department of Agriculture.

Much has been said and done to make dairying more profitable; but the other side of farm life, its attractiveness from the standpoint of comfort, right living, and interest to the younger generation, has often been neglected. In a special exhibit on this subject, designed to arouse the interest of dairymen in making their farm buildings more modern and convenient, their homes more comfortable and attractive, the Department has presented reproductions of five farms from as many dairy sections. The farms are well arranged, the barns are of approved type for different sections of the country, and the homes are modern and attractive. They serve to show what can be and is being done to make farm life what it ought to be.

To accomplish this, however, requires financial success. The herds of better dairy cattle shown on the farms are the key to this situation. Through them come the greater returns which make possible the better farms. In all parts of the country farmers are building up herds of better cattle through greater attention to breeding. Feeding and selection will raise the production and returns from the herd to a certain level, but beyond this skill in breeding is required.

Some men are able to buy good breeding stock. Others buy a good purebred bull and grade up the herd. There are others, however, who feel that they can not afford to buy a good purebred bull. For these dairymen the Department calls attention to the cooperative bull association--- an organization of dairymen through which members obtain the use of good bulls at a small cost. A good dairy bull takes the speculation out of dairying. Seldom is there a crop failure in a good dairy herd. The income is steady, and the land is kept fertile.

Another point emphasized in the exhibit is the need of making farm life more attractive, in order to keep the boys and girls on the farm. Good purebred cattle, attractive and comfortable farm homes, keep the interest of the young folks where it belongs---at home.

1. The first part of the report

2. The second part of the report

3. The third part of the report

4. The fourth part of the report

5. The fifth part of the report

6. The sixth part of the report

7. The seventh part of the report

8. The eighth part of the report

9. The ninth part of the report

10. The tenth part of the report

11. The eleventh part of the report

12. The twelfth part of the report

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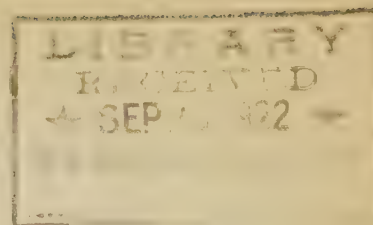
18. The eighteenth part of the report

19. The nineteenth part of the report

20. The twentieth part of the report

UNITED STATES DEPARTMENT OF AGRICULTURE  
Dairy Exhibit - 1922.

DAIRY CATTLE BREEDING.



The U. S. Department of Agriculture is conducting a series of breeding experiments which are so planned as to afford a direct comparison of Line-Breeding with Outcrossing, and Inbreeding with Outcrossing. Among practical breeders there are strong advocates of each of these systems of breeding, and it is hoped to secure some experimental evidence which will prove of value to breeders of dairy cattle.

A project of this character must of necessity be carried along for a number of years before the first comparative results are secured, and at the present time heifers of the first generation in one of the experiments are approaching breeding age, and the first heifers in the other project are all less than one year old.

Meanwhile statistical studies are being made of the material available in the form of official test records. These records are being used in the compilation of the breeding records of the sires of different breeds, with a view of determining the relative ability of bulls to transmit high production to their offspring.

These studies have revealed the fact that a given sire may be prepotent in increasing milk yield and at the same time invariably decrease the percentage of butterfat of his daughters as compared with their dams. He may be just the reverse, and decrease the milk flow but increase the percentage of fat; or he may increase or decrease the quantity of both milk and butterfat. All four types are illustrated in the tables shown:

Bull 1	increased	milk,	decreased	percentage	of	fat.
Bull 2	"	"	increased	"	"	"
Bull 3	decreased	"	decreased	"	"	"
Bull 4	"	"	increased	"	"	"

This would indicate that the factors for milk yield and butterfat percentage are transmitted independent of each other.

Another fact brought out by these statistical studies through a pedigree analysis is that more than 80 per cent of the Holstein breed traces in a direct male line to five great foundation sires; and of these five, two are sons and one a grandson of the cow DeKol 2d.

It is interesting to know that the handling and feeding of cows and heifers under test conditions develops their productive capacity. This has been found to be true for the two breeds already studied, the Jerseys and Guernseys, as 601 Guernsey cows which made their initial advanced-register records at the age of 5 years averaged 488 pounds of butterfat, while 227 cows making re-entry records at the same age averaged 574 pounds of butterfat, a difference of 86 pounds of butterfat in favor of those which had had a previous test. Likewise 605 Jersey cows re-tested at 5 years produced an





Dairy Cattle Breeding----2.

average of 531 pounds of butterfat, which is 70 pounds more than 1065 cows made on their initial tests at the same age.

To make comparative studies of records of dams and daughters of different ages, it was necessary to determine the effect of increasing age on the production of butterfat, in order that heifer records could be adjusted to a mature basis. This work has been completed for Jerseys and Guernseys, but will be extended to include the other dairy breeds.

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UNITED STATES DEPARTMENT OF AGRICULTURE.

Dairy Exhibit - 1922.

WHIPPING QUALITY OF CREAM.

Whipped cream is a valuable food. While it is generally considered an appetizing delicacy only and is used as the basis of many desserts, or to garnish or improve others, when thus used it increases the food value of the dish. Its increasing use, both commercially and in the home, has brought with it a demand for greater knowledge concerning the factors which influence the whipping qualities.

As shown in an exhibit on this subject presented by the U. S. Department of Agriculture, the most important factors which influence whipping quality of cream are; kind of cream, age, butterfat content, and temperature. Any one of these factors is sufficient to render what would otherwise be an excellent whipping cream useless for whipping purposes.

Raw cream excels pasteurized, homogenized, and pasteurized-homogenized cream in whipping quality.

Pasteurization is slightly detrimental to the whipping quality of cream, and especially so in the case of cream with a butterfat content below 23 per cent.

Homogenization is very detrimental to the whipping quality of cream. The higher the homogenizing pressure, the poorer the whipping quality.

Homogenizing and pasteurizing combined practically destroy the value of the cream for whipping purposes.

The whipping quality of cream, regardless of whether the cream contains a high or low per cent of fat, or whether it is raw, pasteurized, homogenized, or pasteurized-homogenized, is improved by age. However, the age required to obtain a satisfactory whip varies with the kind of cream and the per cent of butterfat. In every case the most rapid changes occur in the first 48 hours and at approximately 72 hours the maximum whip is obtained.

The whipping quality of cream improves with an increase in butterfat content up to 30 per cent, after which the quality of the whip shows no marked increase, but the standing-up quality is improved and there is a decrease in the time required to whip.

Temperature is an important factor in the whipping of cream. To insure good results the temperature of the cream should not exceed 45 degrees F.

Increasing the acidity, either by adding lactic acid or by allowing the natural formation of acid, does not affect the whipping quality until the acidity content exceeds 0.3 per cent, at which time the cream acquires a sour taste.

Viscogen, when properly used, increases the whipping quality of raw or pasteurized cream, and does not affect its flavor. It should not be used, however, in cream which is intended for sale without first consulting local, State and Federal laws in regard to its use and labeling.

Sugar when added in quantity sufficient to sweeten thoroughly, decreases the quality of the whip regardless of whether added before or after whipping - the smaller the amount added, the less the effect.



## Whipping Quality of Cream----2.

Flavoring extract, added in sufficient quantity to flavor, affects neither the whipping quality or the quality of the whip.

Temperature, quality of the whip, and butterfat content are the important factors affecting the standing-up quality of whipped cream.

Powdered cream is useless for whipping purposes. Although evaporated milk will whip, it is not useful for whipping purposes because it will not stand up.

Those desiring more complete information on this subject should apply for United States Department of Agriculture Bulletin No. 1075, "The Whipping Quality of Cream".

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UNITED STATES DEPARTMENT OF AGRICULTURE.

Dairy Exhibit - 1922.

FEEDING DAIRY CALVES.

What shall we feed the calves?

The problem of raising calves so that they will reach their fullest development as dairy animals, while at the same time keeping down the cost of the ration, is a problem for every dairyman, but especially for those in market milk sections where skimmilk is scarce.

For some years, the U. S. Department of Agriculture has been working on calf feeding problems at the Dairy Experiment Farm at Beltsville, Md. One of the problems was to devise a calf meal which would be a satisfactory ration for calves. The following mixture has been found satisfactory for this purpose: Corn meal, 50 pounds; rolled oats, 15 pounds; linseed oil meal, 15 pounds; dried blood flour, 10 pounds; skimmilk powder, 10 pounds; and salt, 1/2 pound.

A number of calves were fed, during the first six months, 300 pounds of whole milk and 268 pounds of the calf meal together with hay, silage and grain. This quantity of meal replaced approximately 2000 pounds of skimmilk formerly fed in the same ration. During the first 10 days each calf received 10 pounds of its mother's milk, after which the milk was gradually reduced and the calf meal increased until at 50 days of age and thereafter each calf received 2 pounds of the meal but no milk. During the six months, the calves made an average gain of 235 pounds each, which is approximately the same as for calves on skimmilk.

In regions where skimmilk is plentiful, liberal quantities of skim-milk can be fed without injury to calves. The greater the quantity fed the greater the gain, but the gains are smaller per pound of skimmilk. The gains shown below were made by 16 calves divided into four groups of 4 calves each. Each calf received its mother's milk until 10 days old. A change to skimmilk was made gradually and at 15 days of age all were on full skimmilk rations with the results shown below.

Group	Skimmilk per day.	Daily gains, average.	Skimmilk per pound of gain.
	Pounds	Pounds	Pounds
1. Fed skimmilk at rate of 1/7 body weight	13.5	0.95	14.2
2. " " " " " 1/6 " "	17.0	1.09	15.7
3. " " " " " 1/5 " "	21.0	1.26	16.6
4. " all they would take twice daily.	24.2	1.48	16.3

No bad results were noted from feeding large quantities of skimmilk.





## Feeding Dairy Calves----2.

In winter, skimmilk should be fed warm, as it is more palatable, makes larger gains, and more economical gains. Cold skimmilk chills calves in winter and may cause indigestion. Skimmilk fed warm part of the time and cold part of the time is better than cold skimmilk all of the time.

To make one pound of gain the following quantities of skimmilk were required: Warm skimmilk, 14.3 pounds; warm and cold skimmilk, 15.1 pounds; cold skimmilk, 24.5 pounds.

Sour skimmilk, if clean and not too old, may be fed to calves in summer. As it must be fed without warming, it is not suitable for winter feeding. No bad effects were noted when a change was made abruptly from sweet to sour, or sour to sweet, skimmilk.

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UNITED STATES DEPARTMENT OF AGRICULTURE

Dairy Exhibit - 1922.

VALUE OF PUREBRED SIRES.

"If, as is often claimed, purebred livestock is better than the common kind, can you give me some definite figures on the subject?" To answer questions of this kind, the U. S. Department of Agriculture recently conducted an inquiry covering 36 States and including 25,000 head of breeding stock owned by 525 practical farmers. The stock included purebreds, crossbreds, grades, and scrubs, so there was ample basis for comparison. The results, in part, are as follows:

Purebred livestock has about 40 per cent greater earning power (apart from its breeding or sale value) than scrub stock.

The superiority of purebreds on a utility basis is due principally to: Better conformation and quality, increased production, more economical production and earlier maturity.

When purebred sires are used to improve farm livestock the offspring is more salable than that of nonpurebred sires and brings nearly 50 per cent greater returns.

As seen in the booth "Value of Purebred Sires" of the U. S. Government Exhibit, the superior earning power of purebred stock compared with ordinary kinds varies with the different classes of animals. It is considerably higher for dairy cattle than for any other class, poultry being second. The high percentages representing the earning power of well-bred dairy cattle and poultry compared with scrubs are explained doubtless by the greater facilities for keeping production records of these classes of livestock, thereby contributing to their improvement.

The results obtained in this inquiry show conclusively that well-bred animals are good property, not simply for the experienced breeder but for every farmer willing to give them the proper care and opportunity to prove their worth.

The average increase in financial returns from livestock raising traceable to the use of purebred sires was 48 per cent. These facts and figures on high utility value of purebred animals are a part of the "Better Sires--Better Stock" movement conducted by the various States and the U. S. Department of Agriculture. The purpose is to encourage and assist livestock owners in benefiting themselves and the public by raising better domestic animals. Reports on the progress of the work, posters, bulletins on breeding, and other helpful literature may be obtained by applying to the Bureau of Animal Industry, U. S. Department of Agriculture.





# UNITED STATES DEPARTMENT OF AGRICULTURE.

Dairy Exhibit - 1922.

## SILAGE FLAVORS AND ODORS IN MILK.

With the increasing use of silage on many dairy farms, the problem of producing milk, free from silage flavors and odors, has become of considerable importance. Market milk which contains pronounced silage flavors and odors is objectionable to many consumers and in some cases such milk is rejected.

In order to determine how silage can be fed so as to have the least effect on the flavor and odor of milk, the U. S. Department of Agriculture has been carrying on extensive experiments in silage feeding. The results of these experiments, as summarized in the Department exhibit on this subject, are as follows:

Silage fed soon after milking has the least effect on milk flavors and odors. The following table shows the effect of feeding various silages one hour after milking:

Cows fed -	Milk Samples		Same milk after aeration	
	Per cent	Per cent	Per cent	Per cent
	off-flavor	off-odor	off-flavor	off-odor
15 to 25 lbs. corn silage .....	60	48	8	8
5 " 20 " alfalfa silage ....	72	62	36	36
5 " 20 " soy-bean silage ...	75	75	-	-
5 " 15 " sweet clover silage :	93	97	66	70

Silage fed one hour before milking gives undesirable flavors and odors to the milk. This is shown in the following table.

Cows fed -	Milk Samples		Same milk after aeration	
	Per cent	Per cent	Per cent	Per cent
	off-flavor	off-odor	off-flavor	off-odor
20 pounds corn silage .....	72	100	72	80
5 to 20 pounds Alfalfa silage ..	100	100	100	100
5 " 20 " soy-bean silage..	100	100	--	--
5 " 15 " sweet clover silage. :	93	97	66	70

Comparing these two tables it will be noted that feeding silage after milking results in a smaller per cent of samples with silage flavors and odors. The difference in favor of feeding silage after milking was even greater than the figures indicate, inasmuch as the flavors and odors in milk so produced was much less pronounced and more easily removed by aeration than where silage was fed before milking.

Aeration of the milk soon after it was produced and while still warm reduced the silage flavors and odors markedly.

Silage flavors and odors are largely absorbed while the milk is in the body of the cow rather than from silage odors in the stable air.





UNITED STATES DEPARTMENT OF AGRICULTURE

Dairy Exhibit - 1922.

HOW TO CLEAN MILKING MACHINES.

A simple but effective method of cleaning and sterilizing milking machines, as shown in the Department of Agriculture exhibit on this subject, is presented below:

Immediately after milking, rinse the machines with cold or lukewarm water drawn through the machines by vacuum. Break the flow occasionally by pulling the teat cups out of the water and then immediately immersing again. Do this ten or twelve times.

Repeat process with hot water containing washing powder. Wash teat cups and tubing with a brush at this time.

Rinse units with clean water drawn through by vacuum.

Detach long milk tube with claw and teat cups from head of pail. Plug air tubes (on inflation types of machines), and place the whole in a tank of clean water, care being taken that all parts are entirely submerged. Heat the water to a temperature of 160° to 170° F. and hold there for 15 to 30 minutes. Allow the water to cool and the parts to remain there until the next milking. (A covered tank will usually hold the temperature above 160° for the required length of time, if heated to 165° or 170° F.)

Twice each week take the machines entirely apart and wash thoroughly with brushes and hot water containing washing powder. The vacuum line should be cleaned about every two weeks by drawing hot water, containing washing powder, through it with vacuum. If milk is drawn into the vacuum line, clean the pipe immediately after milking.

The moisture trap or check valve on the head of the machine (cover of pail) should be cleaned every day.

Milking-machine pails and covers should be thoroughly washed and sterilized with steam or by immersion in boiling water for 5 minutes, after every milking. (Pulsators, if on head or cover of pail, should be removed before sterilizing.)

In preparing the cows for milking, the same care should be used as in milking by hand. It is necessary that the teats be very clean if a clean milk is to be obtained.

The effect of heating on the rubber parts has not been fully determined by the Department as yet. So far, however, the temperatures used have not been any more detrimental to the life of the rubber than other methods of sterilization.

Bacterial counts obtained on comparative tests made with machines sterilized by this method, and others sterilized in a chlorinated-lime solution, have been in favor of the heat method for sterilizing. This is undoubtedly due to the fact that the heat penetrates more thoroughly all the cracks and crevices.



UNITED STATES DEPARTMENT OF AGRICULTURE.

Dairy Exhibit - 1922.

PREVENTION OF MOLD IN BUTTER.

There is probably no one trouble that causes butter dealers so much annoyance or creameries so much loss as the growth of molds on the inside of butter tubs. This trouble is not confined to any one geographical section or to any one type of factory. It may be only an occasional outbreak in the best managed factory, or it may become a chronic condition which the buttermaker is unable to control. Warm, damp weather conditions are especially favorable for the growth of mold, and consequently it is found most frequently in the spring and early summer.

The source of contamination may be the cream, the apparatus, the parchment liners, the packages, or the refrigerator; but air, moisture, food, and moderate temperatures are the main factors which stimulate the germination and growth of mold spores.

Scientific studies have shown that the prevention of mold is comparatively easy, demanding only the application of heat, some simple remedies, and the general rules of sanitation.

In preparing the material for this exhibit, a number of five-pound butter tubs and liners were obtained, and each one was thoroughly contaminated with butter mold.

For treatment A, the tubs and liners were soaked in cold water before being filled. As shown by the photograph, the mold made a very abundant growth.

For treatment B, the tubs and liners were soaked in a saturated solution of cold brine. The mold in these tubs made considerable growth but not so abundant as under treatment A.

For treatment C, the tubs were soaked in water and then steamed for 30 seconds with live steam, and the liners were dipped in a saturated solution of boiling brine. A very small amount of mold could be observed on these tubs.

For treatment D, the tubs were soaked, steamed for 30 seconds, then paraffined and coated with salt. The liners were left in a saturated solution of boiling brine for 30 minutes. As shown by the photograph, the growth of mold, by this treatment, was entirely prevented.

Under the supervision of the U. S. Department of Agriculture, several million pounds of butter have been packed in tubs and liners treated similarly to this method and no cases of mold have been reported. Satisfactory results are almost certain to follow the use of this inexpensive treatment.





UNITED STATES DEPARTMENT OF AGRICULTURE.

Dairy Exhibit - 1922.

DAIRY CATTLE MANAGEMENT.

What effect does the handling of cows under advanced registry conditions have on milk and butterfat production? To find the answer to this question, the U. S. Department of Agriculture conducted experiments in which a number of cows were handled one year under ordinary herd conditions and one year under advanced registry conditions. The cows under ordinary herd conditions were confined in stanchions, fed twice a day according to common feeding standards, and bred early in the lactation period. When under advanced registry conditions, they were confined in box stalls, milked and fed three times a day, fed in excess of ordinary standards, and bred near the end of the lactation period. All of the cows produced more milk and butterfat under these latter conditions; the increase in milk production ranging from 50.1 per cent to 77.9 per cent and in butterfat production from 37.7 per cent to 91.2 per cent. The average increase was approximately 60 per cent for both milk and butterfat.

Having determined the fact that cows produced 60 per cent more under advanced-registry conditions, the next problem was to determine the value of each factor of advanced registry conditions in increasing production. Some of these factors have been studied, and the results are given below.

Frequent milking increases the production of milk and butterfat. With low-producing cows however, the increase is not sufficient to pay for the increased amount of labor required. With high-producing cows, the increased labor is justified. When milking twice a day was compared with milking three times a day, the increased production due to three-times-a-day milking was 11.9 per cent for milk and 12.1 per cent for butterfat. When milking three times and four times a day were compared, the difference in favor of four-times-a-day milking was, milk 6.6 per cent, butterfat 5.8 per cent.

Box stalls, when compared with stanchions in their effect on production, were found to cause an increase in milk production amounting to 5 per cent. As the box stalls required 10.9 pounds more of bedding and 3 minutes more of labor to clean each day, the increased production would not pay for the extra requirements.

What effect has exercise on milk and butterfat production? Experiments carried on by the Department indicate that exercising the cows causes them to eat more feed and also increases very slightly the production of butterfat. The increase was too small to pay for the extra feed consumed.





UNITED STATES DEPARTMENT OF AGRICULTURE

Dairy Exhibit - 1922.

THE USE OF DAIRY PRODUCTS ON FARMS.

In connection with educational Milk-for-Health campaigns which have been conducted in many sections of the country, surveys made through the schools reveal the fact that from 15 to 25 percent of the school children are seriously undernourished.

These surveys also show that in many rural communities only about 50 per cent of the children use milk daily.

A report from a typical agricultural county in the Middle West gives these figures: Two out of every five rural school children do not use milk daily. One out of every six rural school children is seriously undernourished.

Regular weighing and measuring of children at school awakens their interest in health and food habits. An exhibit on this subject shows the forms and records which may be used when the monthly weighing is a part of the regular school routine.

Another part of this exhibit shows how milk may be served at school, either when brought from home to be used at lunch time or when purchased at school. Teachers report that the increased use of milk by the children results in marked improvement in health, conduct, and scholarship.

Not only is milk necessary for the proper growth and development of children, but its greater use is advocated for grown men and women. Milk in the diet of the expectant and nursing mother means better teeth, stronger bones, and improved health for both mother and child.

Hard-working men find milk an efficient food. Milk in the farmer's lunch in the field is both refreshing and nourishing.

For suggestions as to ways and means of incorporating milk in the diet for grown people as well as children, see this exhibit.



# UNITED STATES DEPARTMENT OF AGRICULTURE

## Dairy Exhibit - 1922.

### HOW DAIRY CATTLE ARE DISTRIBUTED IN THE UNITED STATES

The 1920 census figures on dairy cattle are a mine of useful information. This information has been analyzed by the United States Department of Agriculture and is presented in an exhibit in a form which is easily and quickly comprehended.

The most striking fact brought out by the analysis of the figures is that the States which are high in average milk production per cow are those that have the greatest per cent of purebred dairy bulls. The 48 States were arranged in the order of percentage of purebred sires, ranging from 91 per cent for Arizona down to 8 per cent for North Dakota. By dividing the list into four groups of 12 States each and averaging the purebred-sire percentages and the figures on milk production per cow, it was found that the top group on the purebred-sire basis was also the leading group in average milk yield. On through the classification, the average milk production for the groups fell off as the percentage of purebred bulls decreased. This is evidence that it pays to keep animals of improved blood, the department believes.

:Average yearly :		Dairy :		Dairy :		:Average number:		Dairy farms	
State:milk production:		bulls :		cattle :		: of cows per :		: per pure-	
group:	per cow	:	purebred	:	purebred	:	purebred bull	:	bred bull
:	(Pounds)	:	(Per cent)	:	(Per cent)	:	:	:	:
1 :	4427	:	42.5	:	5.5	:	65.7	:	10.2
2 :	3522	:	36.5	:	4.0	:	87.5	:	18.1
3 :	2564	:	18.6	:	1.7	:	195.4	:	63.3
4 :	1606	:	12.6	:	1.4	:	222.6	:	82.3

Supplementing these figures are maps showing the States which are included in the groups listed.

"Are you Proud of the Cows in Your County," is the title of a large map on which there is shown the average yearly production of cows in practically every county in the United States. Here the dairyman can see at a glance how his county compares with others. On this map it is shown that seven counties have averages greater than 6020 pounds of milk per year of which three are in Washington, and 1 each in Oregon, California, Nevada and Texas.

On another panel is shown the number of farms that would have to be visited in each State to find a purebred dairy bull. In one group of States there is one purebred dairy bull for every ten dairy farms, while in another group of States more than 82 dairy farms would have to be visited to find a purebred bull.





United States Department of Agriculture  
Dairy Exhibit - - 1922.

DAIRY HERD IMPROVEMENT.

This exhibit emphasizes the marketing of home-grown feeds by selling them to high-producing dairy cows.

One panel pictures three Jersey herds; an ordinary herd of grades, a fine herd of grades, and a splendid herd of purebreds. The results that come from selling feed to each of these three herds are described as follows:

"If you sell feeds to dairy cows you have a constant market.

If you sell feeds to high-producing dairy cows, you have a good and constant market.

If you sell feeds to purebred, high-producing dairy cows, you have a double market; a market for calves and a market for milk.

In dairying, the feed market is always exactly what you make it."

Another panel shows two pages from the dairy primer or first reader. In printed words and in picture words the first page says:

"If you sell a scrub cow to a neighbor and buy a good cow from another neighbor, the dairy industry has gained nothing; but if you sell a scrub cow to the butcher and replace her with a good young cow bred in your own herd and sired by a good purebred bull, the dairy industry has gained much."

In a similar manner page two of the primer tells this story:

"In one cow-testing association, the poorest cow in one year's time produced only enough income over cost of feed to buy a 2¢ postage stamp. To pay for labor and overhead expenses the owner had the manure, skimmilk, and calf. The cow-testing association teaches him how to get much more than that."

The third panel shows an up-to-date farmer and his son "listening in" on their dairy herd. The milk scales and the Babcock milk tester tell them the true story of milk and butterfat production regarding each and every dairy cow in their herd.





19  
EXHIBIT

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Dairy Marketing Exhibit 1922.

INTERNATIONAL TRADE IN DAIRY PRODUCTS.

The market situation with regard to dairy products in foreign countries is now not a matter of idle curiosity, but one of vital interest to the dairyman in the United States. This is due to the fact that directly or indirectly his products are sold on a world market. Exporters in countries producing more of dairy products than are consumed in that country sell the surplus to importers in countries that demand more for consumption than is there produced. In both the selling and buying there is competition among the different countries. In fact, the very extent of the "surplus" of exporting countries is determined by the prices obtainable, just as the extent of the consumption in excess of the home production in importing countries is determined by the price at which the products can be obtained.

The United States can hardly be classed as either an exporter or an importer of dairy products, for the reason that this country may either export when the foreign demand justifies it or may become the market for some foreign products when our prices are sufficiently attractive. It becomes necessary, therefore, in order to know the local market, to know also the conditions of supply and demand throughout the world.

The need for constant study of the world supply and demand in regard to the marketing of dairy products is emphasized by recent developments. As a result of the war, a shift has taken place in the great sources of supply from the countries of the northern hemisphere to countries of the southern hemisphere. This shift, with its influence on the world market situation, has involved the United States as a country rather delicately balanced between the position of exporter and importer of dairy products. The United States as a northern dairy country has now, during her flush season of production, a more attractive butter market in England than when England, that greatest of all butter-importing countries, was receiving a larger proportion of the butter from Europe. The English market for cheese, on the other hand, has now become quite completely dominated by the supplies from New Zealand and Canada, whose seasons of production are different and thus complement each other on the markets.



UNITED STATES DEPARTMENT OF AGRICULTURE

Dairy Marketing Exhibit 1922.

DAIRY MARKET STATISTICS.

The milk produced in the United States amounts to over 11,500,000,000 gallons annually or nearly 100,000,000,000 pounds. This milk now supplies more than 107 million people with more than 98 per cent of their annual requirements of dairy products.

The milk, in supplying these requirements, is used in many ways. In the household alone 45.7 per cent or 5,250,000,000 gallons are used in the form of milk and cream. The remaining part of the supply is used either in manufacture, fed to calves or wasted.

It is estimated that 22.4 per cent of all milk produced is manufactured into 1,055,000,000 pounds of creamery butter and 13.8 per cent is converted into 650,000,000 pounds of farm-made butter. Thus, 36.2 per cent of all the milk or nearly one-third of the total production is used in the manufacture of butter.

The production of 1,464,000,000 pounds of condensed milk requires 3.7 per cent of the supply and 356,000,000 pounds of cheese takes 3.6 per cent and 244,000,000 gallons of ice cream takes 3.4 per cent.

It is estimated that 500,000,000 gallons of whole milk is fed to calves and 3.1 per cent is spilled, wasted or lost.

This utilization of milk for various purposes indicates the broad scope of the industry.





UNITED STATES DEPARTMENT OF AGRICULTURE

Dairy Marketing Exhibit 1922.

MARKET REPORTS ON DAIRY PRODUCTS.

Market reports on dairy products-are issued as a part of the Market News Service work of the Bureau of Agricultural Economics, United States Department of Agriculture. These reports which include butter and cheese, cover the wholesale markets at New York, Chicago, Boston, Philadelphia and San Francisco, and the primary cheese markets of Wisconsin. At these markets branch offices are maintained at which representatives of the Department maintain close contact with the larger and more important wholesale dealers and obtain information regarding the supply, demand, movement and prices of these products. This information is transmitted by telegraph between these offices and is released in the form of Weekly Market Reviews.

In addition to the daily and weekly market reports on butter and cheese, monthly reports on milk market prices, condensed and evaporated milk and milk powder are issued from the Washington office which cover all the larger markets in the United States. Telegraphic reports also are issued where firms pay the cost of the telegrams. A large portion of the information is released also by radio service. The following is a list of the various reports issued, and anyone desiring these reports can obtain them, upon request, of the Division of Dairy and Poultry Products, United States Department of Agriculture, Washington, D. C.

List of Reports Issued.

- \*Daily Market Report.  
(Butter, Cheese, Eggs, Dressed Poultry.)
- \*Weekly Butter Market Review.
- \*Weekly Cheese Market Review.
- \*Monthly Export Report.
- \*\*Monthly Milk Price Report.
- \*\*Monthly Condensed Milk Market Report.
- \*\*Monthly Powdered Milk Market Report.
- \*Monthly Cold Storage Report.

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\*Issued from Washington and branch offices.

\*\*Issued from Washington office only.





UNITED STATES DEPARTMENT OF AGRICULTURE

Dairy Marketing Exhibit 1922.

COOPERATIVE DAIRY MARKETING.

What is cooperation? Why do some farmers'-cooperative-dairy-marketing associations succeed? Why do others fail?

There are many causes. But the fact that over 200,000 farmers market dairy products cooperatively is evidence that cooperation in dairy marketing is often a success, and this success often depends upon obtaining a sufficient volume of business, employing capable management and following up-to-date business methods.

Results cannot be produced in a cooperative marketing organization unless it is used by the members. To some extent the organization may be strengthened by membership contracts which hold the members together thus insuring a certain volume of business.

"United Effort Gives Strength" and confidence is produced by efficient management and economical service. No farmers' cooperative organization can continue to live that is managed arbitrarily. It is likely to succeed only as the members develop a living, active spirit of mutual effort which must be manifested in the board of directors.

The ultimate success of any cooperative marketing effort depends on the will of the farmer to cooperate; on a spirit of mutual confidence and on trust in one another.



## UNITED STATES DEPARTMENT OF AGRICULTURE

Dairy Marketing Exhibit 1922.

### ESSENTIALS FOR SUCCESSFUL MARKETING.

The four essentials for success in marketing may be expressed in the four words - Organize, Standardize, Merchandise and Advertise. There must be applied sound business principles, for efficiency is essential to success, and unless an organization is efficient it cannot succeed.

A perfected organization necessarily must provide such facilities as are required for the conduct of the business and since it must perform a needed service it must be adapted to the purpose it is to serve.

An organization must also be adequately financed, with ample funds both for equipment and operating expenses.

It must be capably managed, for good management is the keystone of success.

It also must keep complete records, for efficient management is impossible without them.

To succeed in marketing, Standardization is essential, for by it quality is unified and trading is facilitated. It makes merchandising easier, for trade once established is maintained, also demand is encouraged. Supplemented by advertising, use is stimulated and demand stabilized.

But to merchandise successfully four factors need consideration:

1. Salesmanship in itself promotes confidence and increases sales.
2. Service must be of a continuous and dependable character.
3. Quality encourages a longer use.
4. Price must be adjusted to meet supply and demand conditions.



UNITED STATES DEPARTMENT OF AGRICULTURE

Policy Statement Number 1932

PRINCIPLES FOR SUCCESSFUL MARKETING

The four essentials for success in marketing may be expressed in the four words - Product, Price, Promotion, and Place. These must be applied to the business principles, for efficiency is essential to success, and unless an organization is efficient it cannot succeed.

A perfected organization necessarily must provide such facilities as are required for the conduct of the business and since its most important service is that to be adapted to the purpose it is to serve.

An organization must also be adequately financed, with ample funds both for equipment and operating expenses.

It must be carefully managed, for good management is the backbone of success.

It also must keep complete records, for efficient management is impossible without them.

To succeed in marketing, Information is essential, for by its quality is limited and trading is facilitated. It is more merchandising easier, for trade once established is maintained, also demand is encouraged.

Supplemented by advertising, use is stimulated and demand established.

But to merchandise successfully four factors need consideration:

1. Salesmanship in itself promotes confidence and increases sales.
2. Service must be of a continuous and dependable character.
3. Quality encourages a larger sale.
4. Price must be adjusted to meet supply and demand conditions.



UNITED STATES DEPARTMENT OF AGRICULTURE

Dairy Marketing Exhibit 1922.

QUALITY IN DAIRY PRODUCTS.

Is quality in dairy products important? What does it bring?

It brings to producers higher prices.  
It brings to manufacturers increased demands.  
It brings to distributors larger sales.  
It brings to consumers greater satisfaction.

In fact Quality brings greater satisfaction to all.

Most people live for the pleasure and satisfaction they get out of living. Why not produce quality dairy products and get an added satisfaction out of living?

Where does quality in dairy products begin? What is required to produce high quality?

Obviously quality begins with the producer, the man who milks the cow. He must use sanitary methods, keep the milk and cream cold and deliver it frequently to market in clean, sweet, and unadulterated condition. The losses to producers annually from poor quality are estimated at \$25,000,000. These losses are deserving of most thoughtful consideration, for by proper methods of production and manufacture they can be eliminated.

Furthermore, quality in dairy products results in increased consumption for satisfied consumers are large users. They appreciate quality, insist on getting it and are willing to pay for it.

Finally it is to be remembered that the problem of the dairy industry is not over production but under consumption and - quality will solve it.

UNITED STATES DEPARTMENT OF AGRICULTURE

Dairy Marketing Bulletin 1923

QUALITY IN DAIRY PRODUCTS

Is quality in dairy products important? What does it bring?

It brings to producers higher prices.  
It brings to consumers increased benefits.  
It brings to distributors larger returns.  
It brings to consumers greater satisfaction.

Is there quality in dairy products? It is all.

Most people live for the pleasure and satisfaction they get out of living. They eat products of dairy products and get an added satisfaction out of living.

Where does quality in dairy products begin? That is required to

produce high quality.

Quality begins with the producer, the man who milks the cow. He must use sanitary methods, keep the milk well creamed and deliver it frequently to market in clean, sweet, and unadulterated condition. The losses to producers annually from poor quality are estimated at \$25,000,000. These losses are the result of most thoughtful consideration, for of proper methods of production and marketing they can be eliminated.

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